

Vision Zero Rockville

Action Item #1 – 2017-2021 Crash Analysis

Introduction

This report provides additional context to the City's Vision Zero Action Plan and offers additional analysis into the City's serious injury and fatal crashes. This analysis also provides next steps and potential Vision Zero safety projects to implement in the near future.

Vision Zero is a strategy to eliminate all traffic crashes resulting in a serious injury or fatality. The Mayor and County adopted a Vision Zero Plan in July 2020. The plan includes 30 action items focusing on four key areas: engineering, education, enforcement, and policy. This analysis is an update to the analysis completed in 2021. Using this crash data as a guide, the city will continue to work to reduce the number of crashes as well as the severity of injuries from crashes when they occur.

Collision data is provided by Montgomery County and is publicly available on the County's online data portal¹. The provided data is from the Automated Crash Reporting System (ACRS) of the Maryland State Police and includes crash reports submitted to the state by Montgomery County Police Department (MCPD), Maryland-National Capital Park Police, Rockville Police Department (RCPD), and Gaithersburg Police Department. This analysis includes crashes that occurred between January 1, 2017, and December 31, 2021² within the City of Rockville municipal boundary. The preceding analysis only included serious injury or fatal (KSI)³ crashes; this analysis includes KSI crashes, and injury crashes of all severities.

Data is separated into four areas of analysis. (1) Spatial Analysis explores the roadway characteristics specific to the locations of the crashes. (2) Temporal and Environmental Analysis discusses the environmental context surrounding the crashes. (3) Behavior Analysis shows the actions that occurred and contributed to each KSI crash, and (4) Equity and Community Analysis focuses on the possibility of vulnerable communities being involved in a KSI crash as well as the public's perception of transportation safety.

¹ <https://data.montgomerycountymd.gov/>

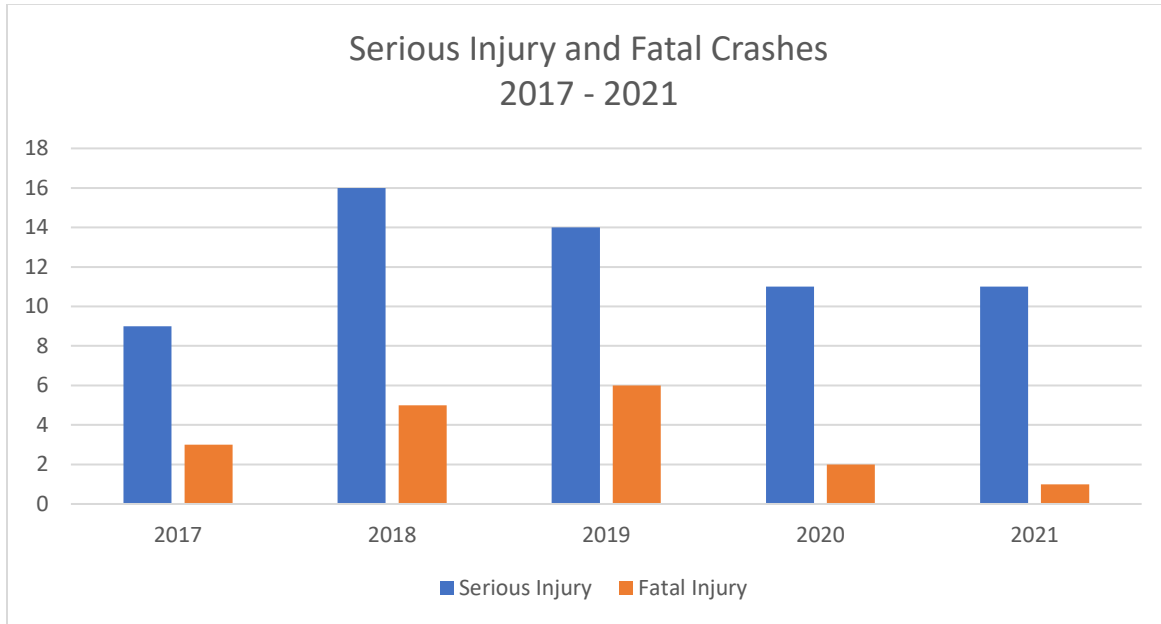
² The data used in this analysis does not include any crashes that occurred on I-270 or freeway ramps. These areas were omitted because the Vision Zero Action Plan focuses on how the City of Rockville can best use its resources on roadways it maintains and perform engineering, education, and enforcement actions as appropriate. The City will continue to collaborate with MDOT SHA to improve roadway safety on the interstate and other state-maintained roadways. However, for the purposes of this analysis, the context of I-270 and its connecting ramps is too different from roadways in the city.

³ A severe injury, or suspected serious injury includes severe laceration resulting in exposure of underlying tissues/muscle/organs or resulting in significant loss of blood, broken or distorted extremity (arm or leg), crush injuries, suspected skull, chest, or abdominal injury other than bruises or minor lacerations, significant burns (second and third degree burns over 10% or more of the body), unconsciousness when taken from the crash scene, and/or paralysis.

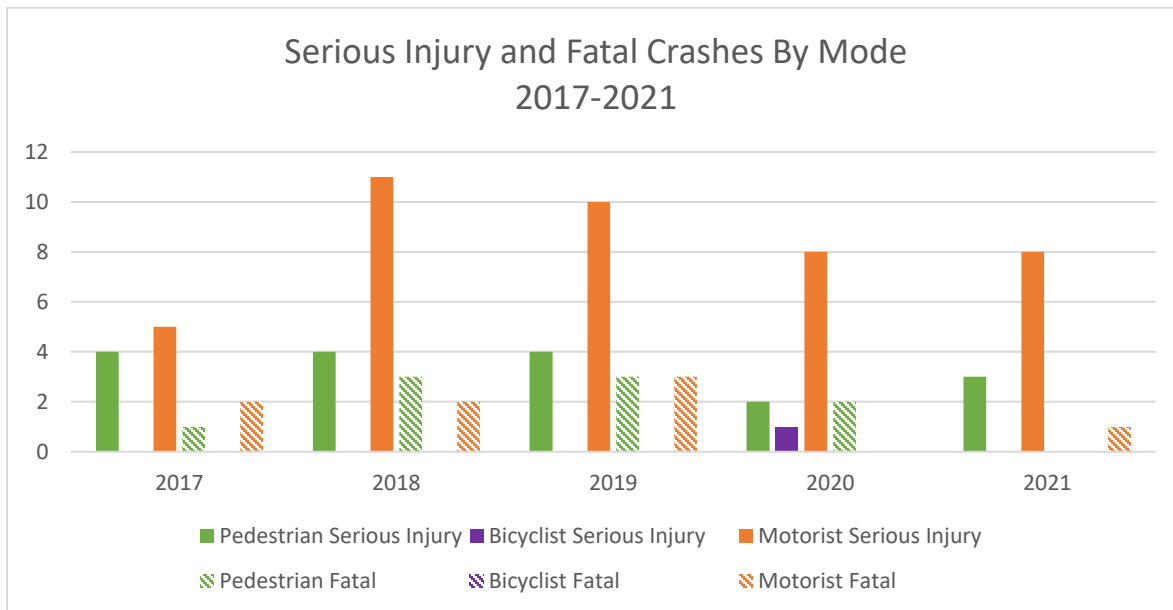
A fatal injury is any injury that results in death within 30 days after the motor vehicle crash in which the injury occurred. In practice, however, Montgomery County Police will update records from a suspected serious injury to fatal within one year of the crash to support possible charges in court. Cases where the person was determined to have perished that were not related to the crash are excluded.

2017-2021 Total Crashes

From January 1, 2017, to December 31, 2021, there were 3,981 reported traffic crashes within the City of Rockville which includes fatal, injury, and property damage crashes. During this time, there were 17 fatal crashes, 61 serious injury crashes, and 1,188 minor or possible injury crashes.



28 of the 78 KSI crashes involved crashes between people walking or bicycling and people driving; the remaining 49 KSI crashes only involved people driving. There were no reported crashes that involved only people walking and bicycling. 17 of the KSI crashes resulted in a fatality, this includes 9 pedestrian fatalities and 7 motorist fatalities. There were no bicyclist fatalities and 1 serious injury crashes involving a person bicycling. For most of this analysis, Pedestrian and bicycle modes are grouped together.



High Injury Network

Montgomery County defines a “High Injury Network” (HIN) as roadway segments with four or more serious or fatal collisions⁴. There are six HIN roadways in Rockville.

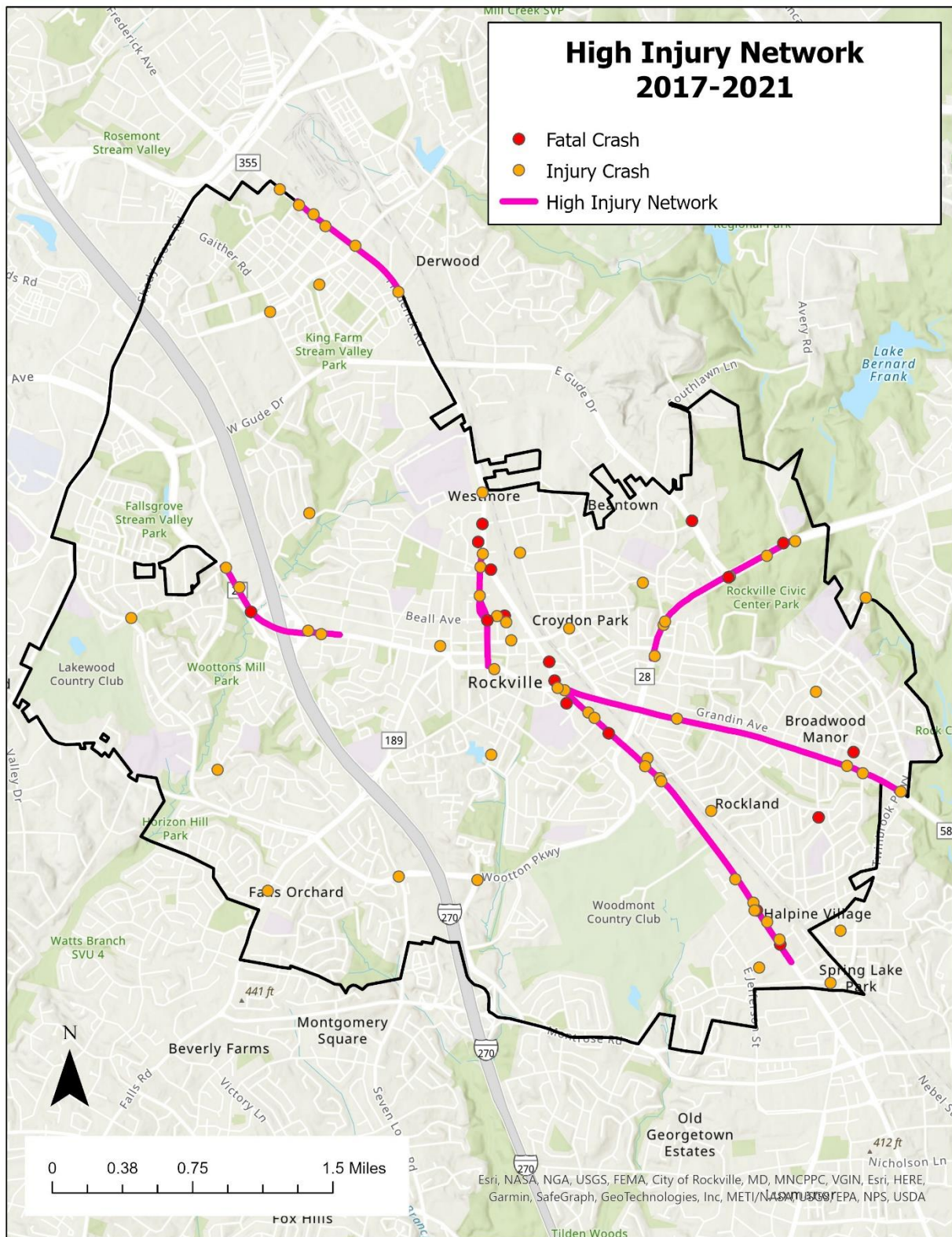
Table 1: 2017 – 2021 High Injury Network

Roadway Name	# of KSI Crashes	From	To
Rockville Pike (MD 355)	14	Veirs Mill Road (MD 586)	Bouic Avenue
W Montgomery Avenue (MD 28)	6	Research Boulevard	Mannakee Street
First Street/Norbeck Road (MD 28)	6	First Street Spur	Avery Road
Frederick Road (MD 355)	6	Ridgemont Avenue	Watkins Pond Boulevard
Veirs Mill Road (MD 386)	5	Rockville Pike (MD 355)	Twinbrook Parkway
North Washington Street	4	Hungerford Drive (MD 355)	W Jefferson Street (MD 28)

These roads account for 41 of the 77 KSI crashes, roughly 53%. Locations with recurring KSI crashes represent areas to focus engineering, enforcement and education efforts to improve safety. There are two changes in the 2017-2021 HIN compared with the 2016-2020 HIN. Hungerford Drive, between College Parkway and E Middle Lane is no longer a HIN roadway segment, and North Washington Street, between Hungerford Drive and W Jefferson Street is added to the HIN.

⁴ Montgomery County, Office of the County Executive, “Vision Zero: No Traffic Deaths in MoCo.” FY22-23 Work Plan, pg 8. <https://www.montgomerycountymd.gov/visionzero/Resources/Files/vz2030-plan.pdf>

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Vision Zero Intersections

There are two Vision Zero Action Items that specifically direct the city to improve intersections; Action Items # 4 and 6, Evaluate Crossings and Unsignalized Intersections, and Improve Traffic Signals, respectively. DPW staff developed a list of priority intersection to focus these efforts. Intersections that had more than five injury crashes of any severity were added to the list⁵. Eleven state-maintained intersections were submitted to MDOT SHA for safety audit reviews, eighteen city-maintained intersections were identified for safety audits by City Staff. Fifteen new intersections have been added to this list, all of which are along state-maintained roadways. Ten of the intersections will be included in the next MDOT SHA request to implement safety audits.

Table 2: Vision Zero Intersections added in 2022

#	Street	Cross-Street	Injury + Fatal Crashes (2017 – 2021)	Recommended Action
1	First St (MD 28)	Baltimore Rd	13	Recommend MDOT SHA Audit for 2023
2	Frederick Rd (MD 355)	Watkins Pond Blvd	17	Recommend MDOT SHA Audit for 2023
3	Frederick Rd (MD 355)	Ridgemont	12	Add to priority list
4	Hungerford Dr (MD 355)	N Washington St	18	Recommend MDOT SHA Audit for 2023
5	Hungerford Dr (MD 355)	Mannakee St	17	Recommend MDOT SHA Audit for 2023
6	Hungerford Dr (MD 355)	Beall Ave	12	Add to priority list
7	Norbeck Rd (MD 28)	Avery Rd	13	Recommend MDOT SHA audit for 2023
8	Rockville Pike (MD 355)	Edmonston Dr	18	Recommend MDOT SHA audit for 2023
9	Rockville Pike (MD 355)	First St	15	Recommend MDOT SHA audit for 2023
10	Rockville Pike (MD 355)	Templeton Pl	15	Recommend MDOT SHA audit for 2023
11	Rockville Pike (MD 355)	Congressional Ln	13	Add to priority list
12	Rockville Pike (MD 355)	Veirs Mill Rd	13	Add to priority list
13	Rockville Pike (MD 355)	Richard Montgomery St	12	Add to priority list

⁵ Four City-maintained intersections that had fewer than five injury crashes were also added to the list per recommendations by the public.

14	Veirs Mill Rd (MD 28)	Rockville Pike	16	Recommend MDOT SHA audit for 2023
15	W Montgomery Ave (MD 28)	Hurley Ave	11	Add to priority list

Spatial Analysis and Roadway Characteristics

Many factors contribute to safe mobility and the Vision Zero Action Plan outlines a comprehensive approach to address all elements of the transportation system. This area of analysis explores roadway characteristics such as ownership, functional classification, and posted speed limit.

Roadway Ownership

Roadway ownership refers to the jurisdiction and agency that owns and maintains the roadway. In Rockville, roads are owned and maintained by the City of Rockville, or the State of Maryland⁶. The State of Maryland has jurisdiction over approximately 15 miles of roadway in the city; roughly 9% of roads, excluding interstates and associated ramps. While these roads make up less mileage than city-owned roadways, they experience higher volumes of daily roadway traffic and more crashes of all types. Of the 77 KSI crashes reported in this analysis, 43 crashes occurred on state-maintained roadways. Five of the six HIN roadway segments are on state-owned roadways. The following tables show the number of injury crashes (all severities) and fatal crashes reported on state- or city-maintained roadways.

Table 2: State Roadway Crashes by Injury (all severities) and Fatal

Roadway Name	Injury Crashes (all severities)	Fatal Crashes
Rockville Pike (MD 355)*	195	5
Veirs Mill Road (MD 586)*	129	0
Frederick Road (MD 355)*	87	0
Hungerford Drive (MD 355)	82	2
W Montgomery Avenue (MD 28)*	73	1
Norbeck Road (MD 28)*	42	2
Falls Road (MD 189)	26	0
First Street (MD 28)	24	0
W Jefferson Street (MD 28)	7	0
Total	674	10

*Included in the City's High Injury Network.

Table 3: City Roadway Crashes by Injury (all severities) and Fatal

Roadway Name	Injury Crashes (all severities)	Fatal Crashes
Wootton Parkway	79	0
W Gude Drive	23	0

⁶ Private roadways within the municipal boundary of Rockville are included in this analysis. There are multiple Montgomery County-maintained roadways that connect into or border the City of Rockville. Since these roads are not within the City and are not maintained by DPW, they are not included in the analysis.

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E Gude Drive	22	1
Maryland Avenue	18	0
Research Boulevard	18	0
Twinbrook Parkway	18	0
Baltimore Road	17	0
N Washington Street*	16	1
Monroe Street	13	0
Redland Boulevard	13	0
Beall Avenue	6	1
Ardennes Avenue	2	1
McAuliffe Drive	1	1
<i>All other City-Maintained Streets</i>	247	0
Total	484	5

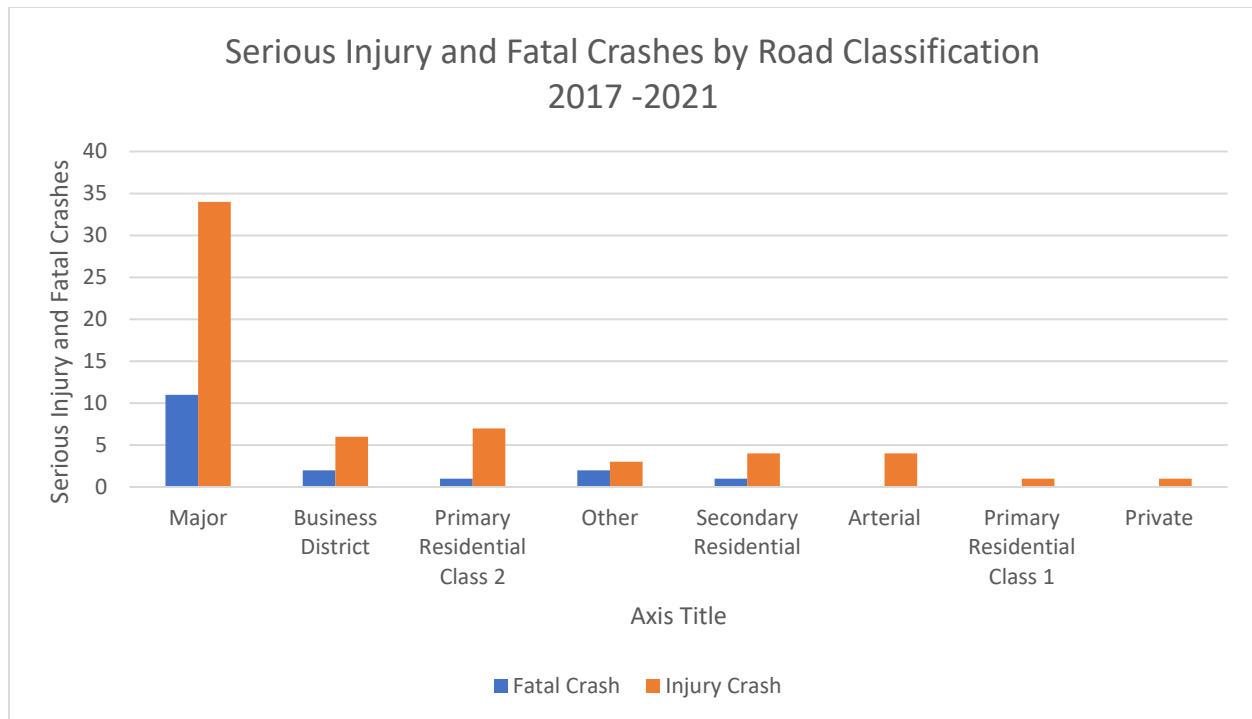
*Included in the City's High Injury Network.

The remaining 86 injury crashes and 2 fatal crashes occurred in parking lots or driveways which are not categorized as state- or city-maintained roadways.

While City of Rockville is not able to modify and improve state-maintained roadways, DPW staff continues to collaborate with MDOT SHA and advocate for roadway safety improvements on state-maintained roadways and intersections.

Crashes by Roadway Functional Class

Roadway functional classifications influence the roadway design and are often determined by their expected function in the transportation network. In Rockville there are nine different functional classes, which have different expected roadway volumes. These range from Limited Access Freeways, which serve at least 50,000 vehicles per day to Secondary Residential Roads, which serve no more than 2,000 vehicles per day. Major arterial roadways (also known as *Major* roadways), such as MD 355, serve more than 25,000 vehicles per day.



45 of the 77 (or 58%) of KSI crashes occurred on Major roadways. In addition to experiencing higher daily motor vehicle traffic volumes, Major roadways generally have higher posted speed limits, multiple travel lanes in the same direction, and frequent driveways and intersections. These attributes contribute to a more complex roadway and there are often multiple factors competing for the attention of motorists. Roadways with fewer lanes and lower posted speed limits, such as residential streets experienced fewer KSI crashes. 5 of the KSI crashes occurred in parking lots and do not have roadway classifications.

Expanding the data set to include all injury crashes shows a similar difference between the number of injury crashes occurring on major roadways and injury crashes occurring on all other roadway classifications. 58% of KSI crashes occurred on Major roadways and this percentage increases slightly to 60% when all injury and fatal crashes are considered.

Table 4: Roadway Classification by Injury (all severities) and Fatal Crashes

Classification	Injury Cash (all severities)	Fatal Crash	% Of all Injury and Fatal Crashes
Major	747	11	60 %
Arterial	97	0	8 %
Other	85	2	7 %
Business District	80	2	6 %
Primary Residential Class 2	80	1	6 %
Secondary Residential	64	1	5 %
Primary Residential Class 1	44	0	3 %
Primary Industrial	36	0	3 %
Private	14	0	1 %

Secondary Industrial	2	0	0 %
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There are ten Major roadways in the City. Three of these roadways are maintained by the City.

Table 5: Major Roadways by Injury (all severities) and Fatal Crashes and Ownership

Major Roadway	Injury (all severities) and Fatal Crashes	Roadway Ownership
ROCKVILLE PIKE	200	MDOT SHA
VEIRS MILL RD	129	MDOT SHA
FREDERICK RD	87	MDOT SHA
HUNGERFORD DR	84	MDOT SHA
W MONTGOMERY AVE	74	MDOT SHA
WOOTTON PKW	67	City of Rockville
NORBECK RD	44	MDOT SHA
FALLS RD	26	MDOT SHA
E GUDE DR	23	City of Rockville
W GUDE DR	23	City of Rockville

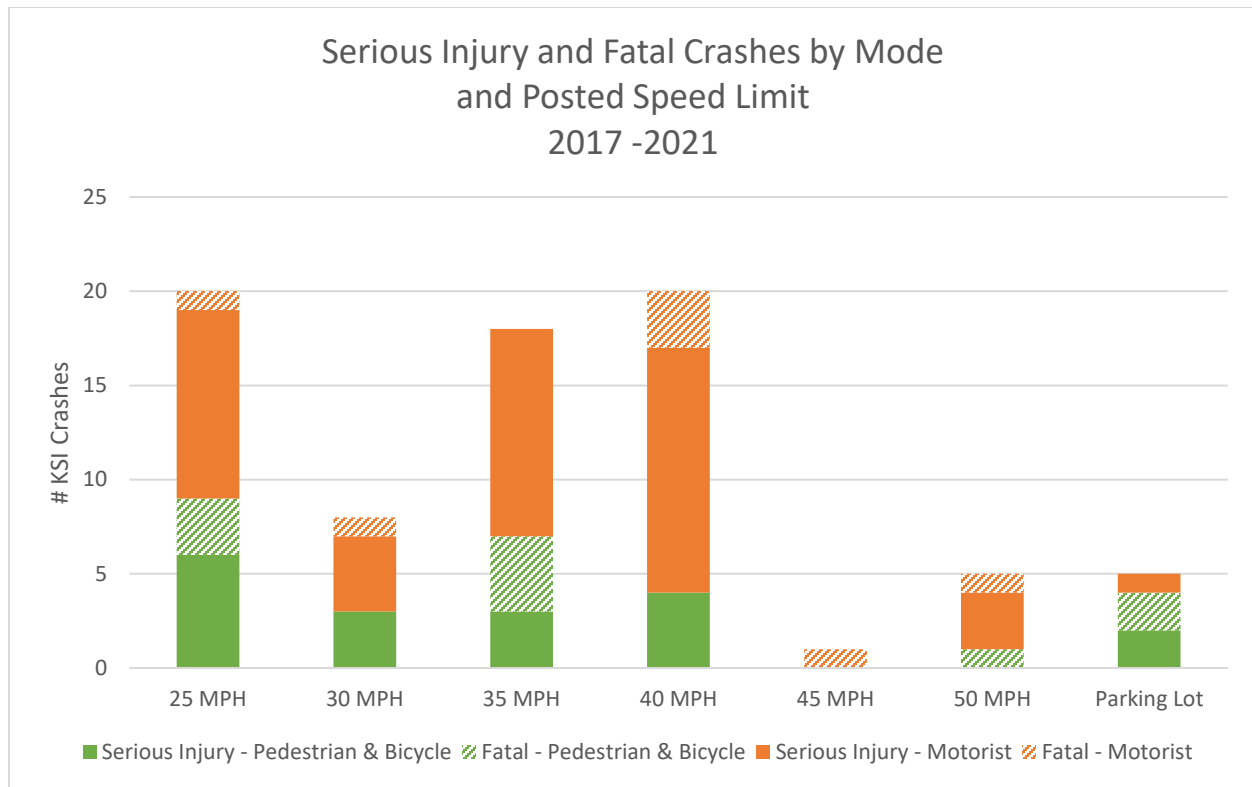
Serious Injury and Fatal Crashes by Speed Limit

The speed a motor vehicle travels influences not only the severity of a crash, but also the likelihood of a crash⁷. While the posted speed limit is not always indicative of the design speed of the roadway or of the operating speed motor vehicles, it can help inform roadway characteristics of crash locations. Also, the posted speed limit is not the speed at which a motor vehicle was traveling at the time of the crash. Vehicle speed is estimated only for crashes investigated by the Crash Reconstruction Unit and is not included in this dataset.

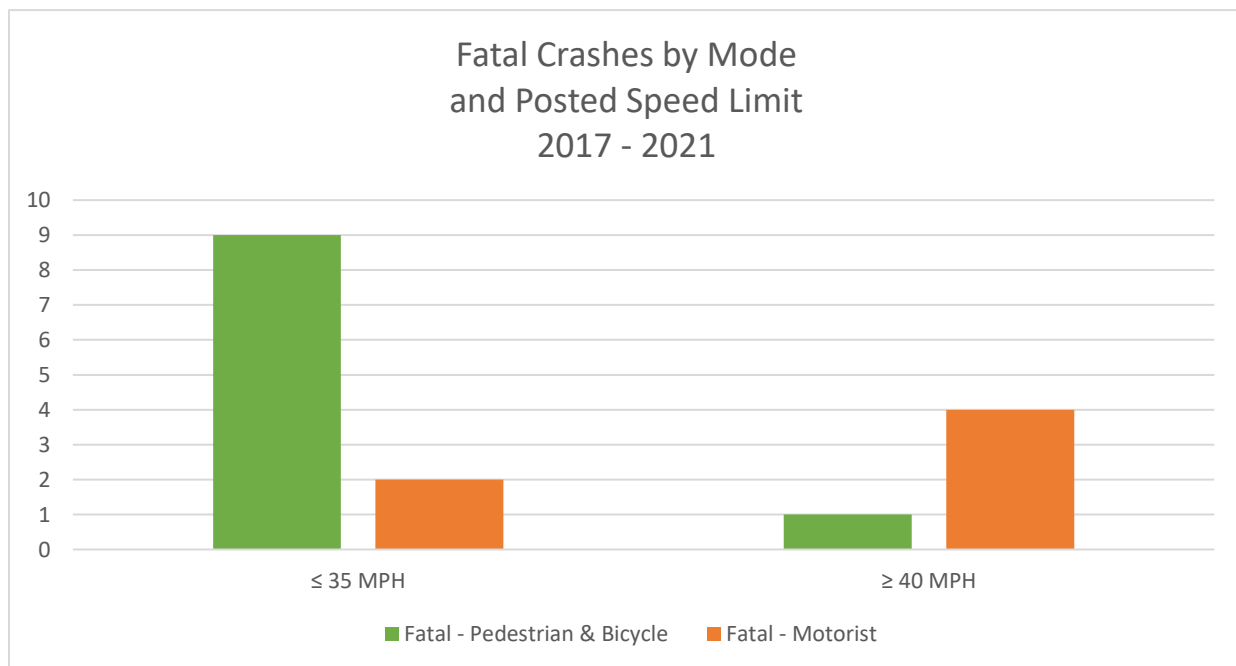
26% of KSI crashes occurred on roads with posted speed limits of 40 miles per hour⁸. An additional 26% of KSI crashes occurred on roads with posted speed limits of 25 miles per hour. When considering only KSI crashes that involved pedestrians or bicyclists, nearly one-third of crashes occurred on roadways with posted speeds of 25 miles per hour, when considering only KSI crashes that involved motorists, just over one-third of KSI crashes occurred on roads with posted speeds of 40 miles per hour.

⁷ Rune, Elvik, "Speed and Road Safety: Synthesis of Evidence from Evaluation Studies, Transportation Research Board: Journal of the Transportation Research Board, Volume 1908, Issue 1, 2005,

⁸ The data in this analysis includes crashes between 2017 and 2022. Since the collection of this data, the posted speed limit along Rockville Pike has been reduced to 35 miles per hour.



While fatal crashes occur on all roadways, regardless of speed, more fatal crashes that involve pedestrians and bicyclists occur on roadways that have a posted speed limits of 35 miles per hour or below.



Serious Injury and Fatal Crashes by Proximity to Bus Transit

Bus stops are a critical component of the City's transportation network, providing the connection mode between pedestrian travel and transit use. The collected crash data does not include descriptions of whether pedestrians and bicyclists involved in crashes were traveling to or from a bus stop. Crashes that occur near bus stops may not be related to bus travel.

In the 2017-2021 dataset, there were 68 reported crashes that involved pedestrians or bicyclists and occurred within 100 feet of a bus stop. Of these, there were two fatal crashes and six serious injury crashes. The KSI Crashes occurred at the following locations.

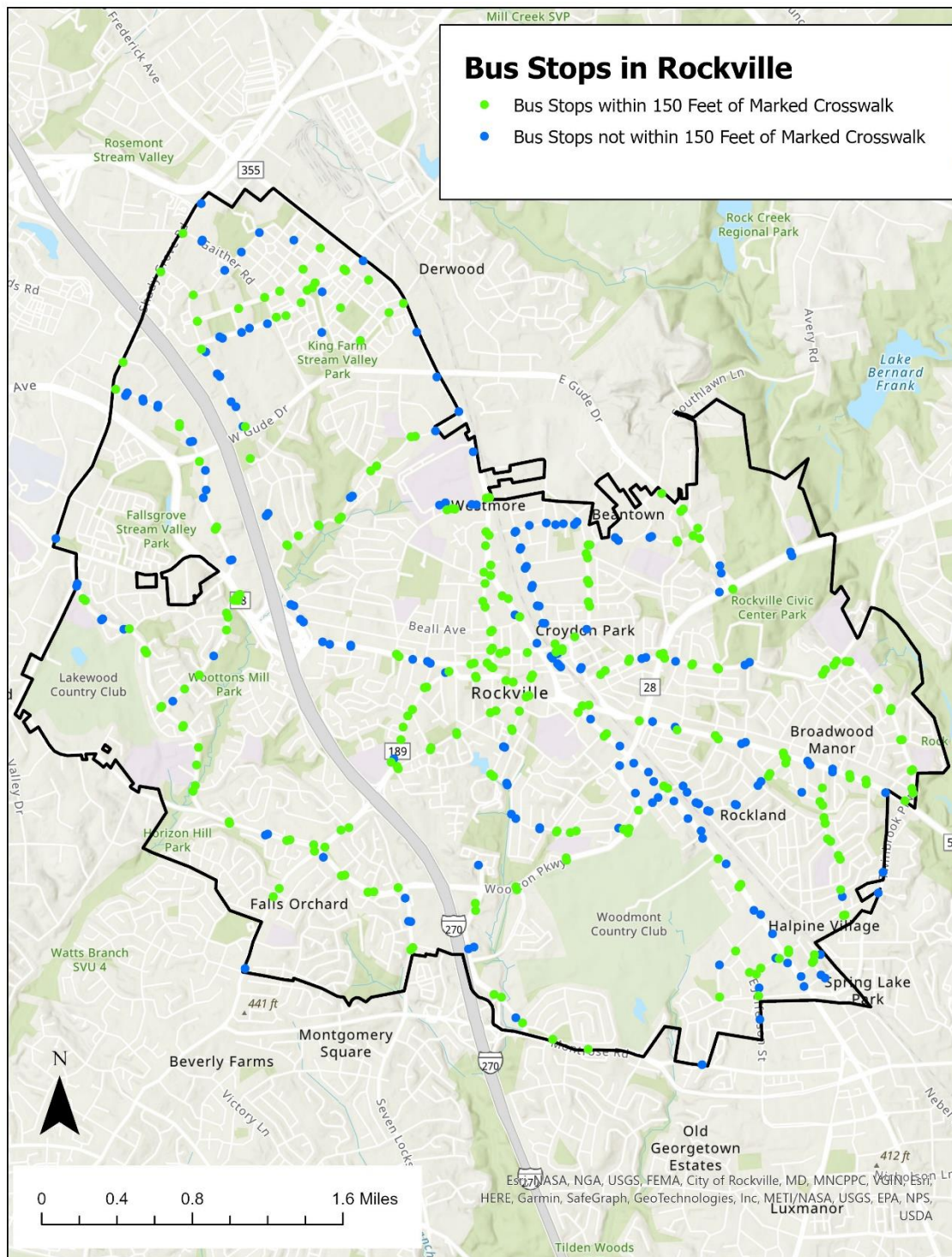
Table 6: Serious Injury and Fatal Pedestrian or Bicycle Crashes within 100 feet of a bus stop

On Street	Near Street	Injury severity
Norbeck Road (MD 28)	E Gude Drive	Fatal
Hungerford Drive (MD 255)	Frederick Ave	Fatal
Halpine Road	Rockville Pike (MD 355)	Serious Injury
Rockville Pike (MD 355)	Congressional Lane	Serious Injury
Veirs Mill Road (MD 586)	Twinbrook Parkway	Serious Injury
Rockville Pike (MD 355)	Edmonston Drive	Serious Injury
N Washington Street	Dawson Avenue	Serious Injury
Pleasant Drive	Crooked Creek Drive	Serious Injury

Bus stop locations can generate additional pedestrian trips and the location of stops may influence how people arrive at, and depart from, the bus. A bus stop that does not have a nearby marked crosswalk may encourage people to cross mid-block. Additionally, bus service, may encourage bus riders to run to catch a bus or another unsafe behavior.

There are 442 bus stops within the City of Rockville. Of these, 260 stops are within 150 feet of a marked crosswalk. The below map shows locations of bus stops within 150 feet of a marked crosswalk. This information will help City staff identify bus stops that should be relocated or whether marked crosswalks can be installed.

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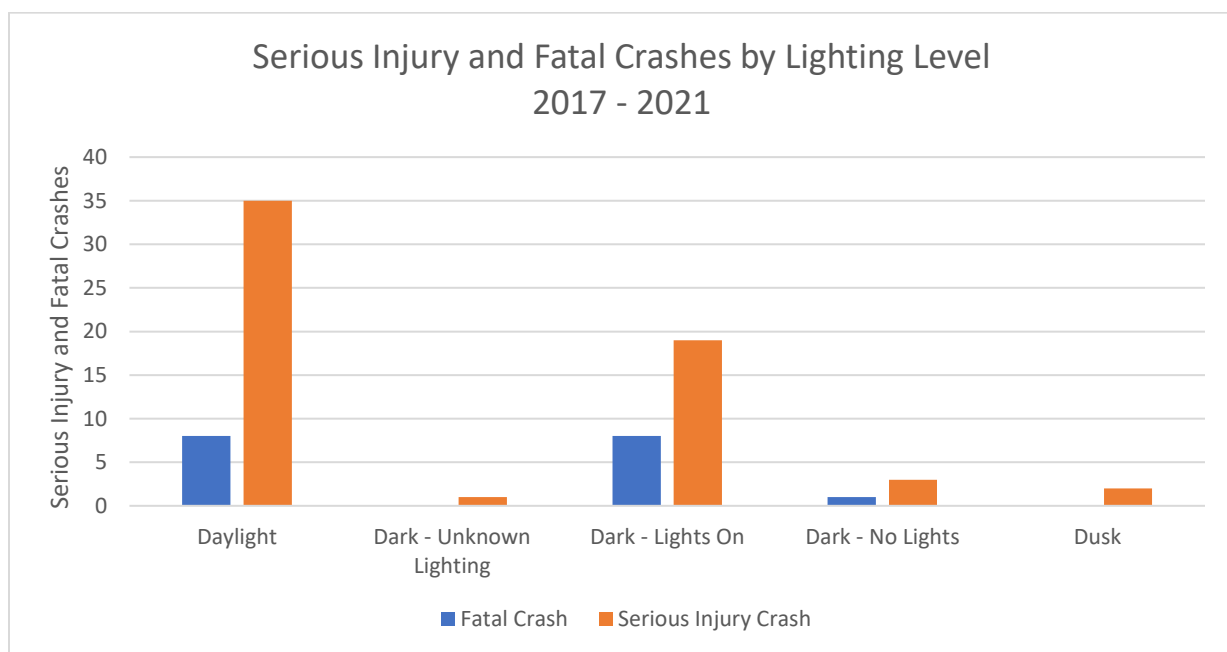
Temporal and Environmental Analysis of Serious Injury and Fatal Crashes

In addition to characteristics of the roadway, environmental factors such as time of day and year, weather at the time of the crash, and level of light can lend further insight to contributing factors of crashes.

Fatal And Severe Crashes by Light Level

The amount of light can provide context for the surrounding environment of the crash; lower visibility can increase motorist reaction times, making crashes less avoidable.

56% of KSI crashes occurred during daylight; 42% of KSI crashes occurred during darkness, and 3% of KSI crashes occurred at dusk. Crashes that occurred in the dark can further be classified by whether streetlighting was available and on at the time of the crash. Among crashes that occurred in the dark, the majority of those crashes occurred in locations where street lighting was present.



Additionally, when categorizing KSI crashes by the mode, there are similar proportions of crashes happening in daylight compared to darkness. For both pedestrian and bicyclist involved crashes, and motorist only involved crashes, more than half of the crashes took place during daylight.

Table 6: Lighting Level by Mode for Serious Injury and Fatal Crashes

	Pedestrian or Bicyclist Involved		Only Motorist Involved	
	Total Crashes	Percentage	Total Crashes	Percentage
Daylight	15	54%	28	57%
Dark	13	46%	21	43%

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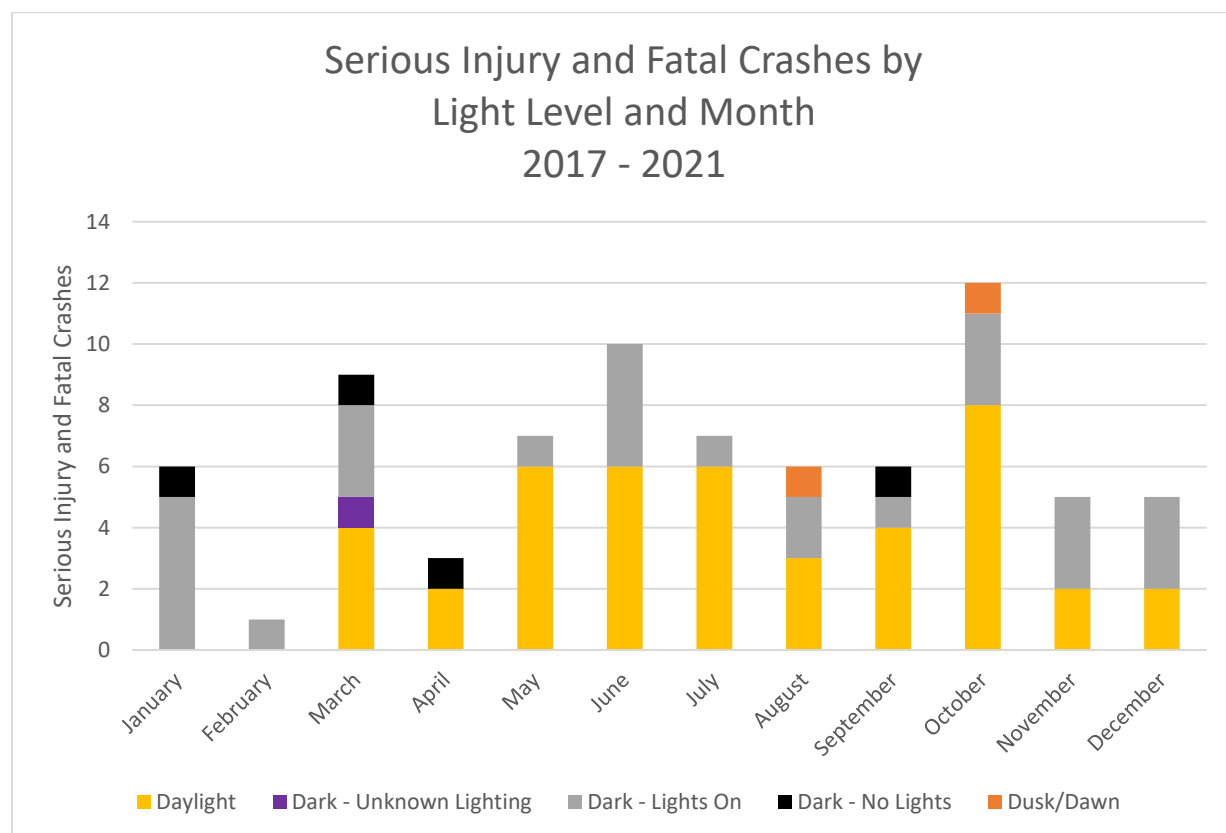
Expanding the dataset to include injury crashes of all severities and fatal crashes shows a more distinct difference between the number of crashes that occur in daylight versus darkness. 69% of injury or fatal crashes occurs during the daytime. Conversely, only one more fatal crash occurred in darkness than in daylight.

Table 7: Lighting Level by Injury Crashes (all severities) and Fatal Crashes by Lighting Level

	Injury Crashes (all severities)		Fatal Crashes	
	Total Crashes	Percentage	Total Crashes	Percentage
Daylight	868	69%	8	47%
Dark - Unknown Lighting	13	1%	0	0%
Dark - Lights On	280	22%	8	47%
Dark - No Lights	24	2%	1	6%
Dusk/Dawn	54	4%	0	0%
Not Reported or Unknown	10	1%	0	0%

Light Level and Month

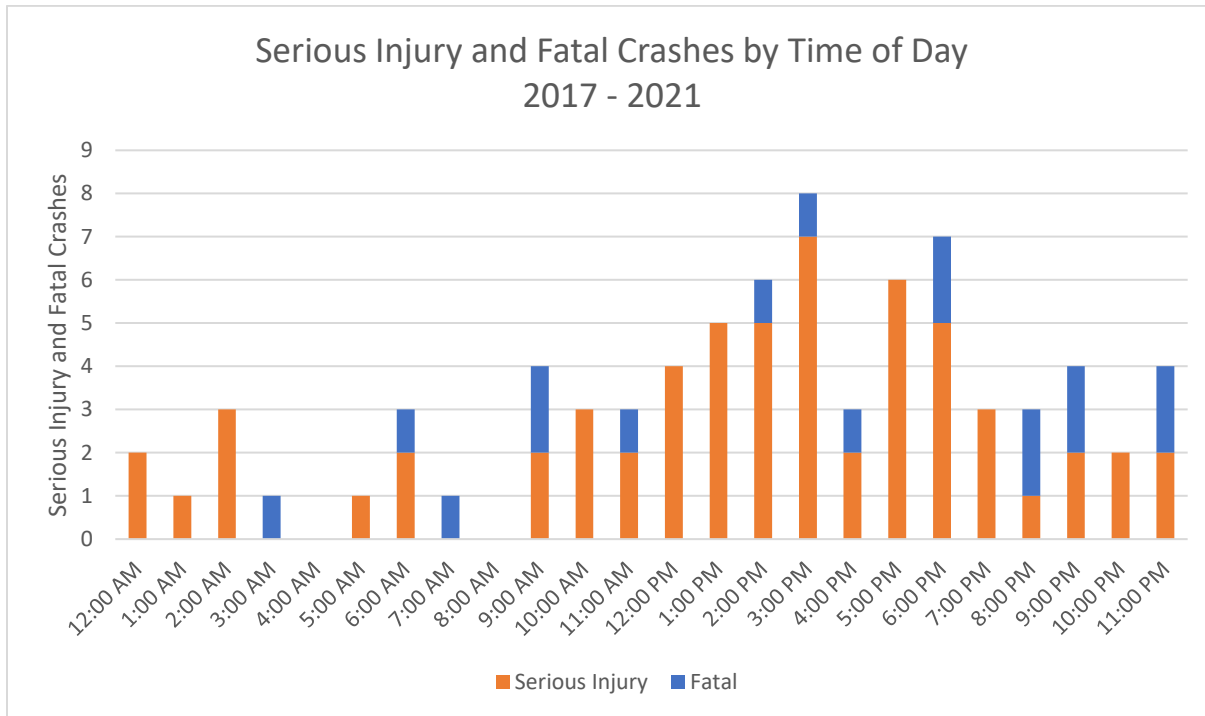
In addition to tracking light levels during crashes, it is also valuable to track light levels and time of month, as more people are traveling when it is dark during winter months.



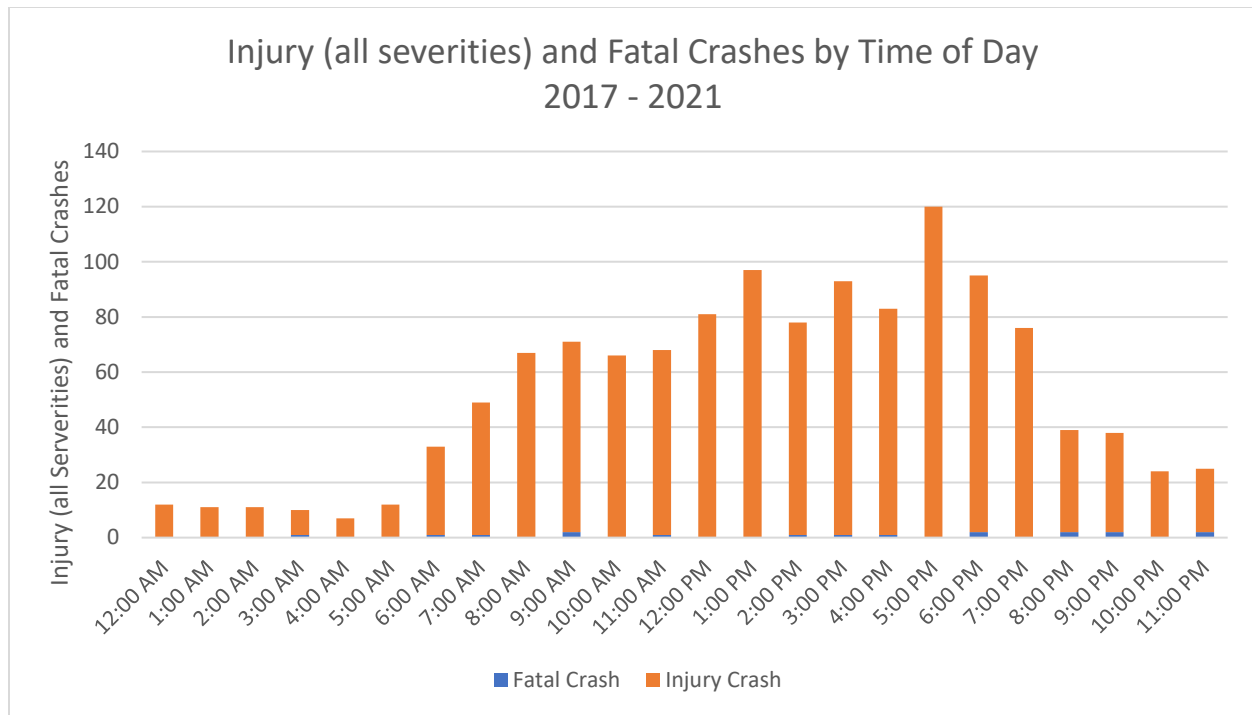
For the collected data, crashes during the dark made up at least 50% of the crashes for January, February, March, November, and December; all months that are partially during daylight savings time.

Crashes by Time of Day

Tracking data by time of day also provides additional context for evaluating crashes. KSI crashes were more likely to occur in the afternoon and evening than in the morning. 6% of all KSI crashes occurred during the morning peak period (7:00 – 9:59 AM) and 21% occurred during the evening peak period (4:00 – 6:59 PM). The three-hour block with the most KSI crashes is 1:00 – 3:59 PM, in which 25% of all KSI crashes occurred. This time period is not considered a traditional “peak hour” traffic period, in which more motorists are on the roadway.



Expanding this dataset to include all injury crashes shows a similar pattern. More crashes occur in the afternoon and early evening than in the morning. 15% of the injury and fatal crashes occurred during the morning peak period, and 24% of crashes occurred during the evening peak period. The evening peak period was also the three-hour period with the most crashes.



Fatal and Severe Crashes by Weather and Pavement Surface Condition

The reported data shows that the majority of KSI crashes occurred during clear weather.

Table 8: Serious Injury and Fatal Crashes by Weather

	Serious Injury Crash	Fatal Crash	Combined Percentage
Clear	43	13	73%
Cloudy	2	2	5%
Raining	9	0	12%
Severe Winds	0	1	1%
Not Reported	6	1	9%

Expanding the dataset to include all injury crashes shows a similar disparity between crashes occurring in clear weather and all other weather types. Nearly 70% of all injury and fatal crashes occurred during clear weather.

Table 9: Injury (all severities) and Fatal Crashes by Weather

	Injury Crash	Fatal Crash	Combined Percentage
Clear	866	13	69%
Cloudy	113	2	9%
Foggy	1		0%
Raining	164		13%

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Severe Winds	1	1	0%
Sleet	2		0%
Wintry Mix	3		0%
Snow	9		1%
Blowing Snow	1		0%
Unknown/Other	6		0%
Not reported	83	1	7%

Additionally, crash reports include a description of the pavement surface, whether it is dry or wet. In nearly all the reported crashes, the pavement surface was reported as dry when the weather was clear. Also similar to weather, the majority (78%) of KSI crashes occurred on dry pavement. When the data set is expanded to include all injury crashes, 74% of crashes occurred on dry pavement.

While both datasets show a minority of crashes occurring during non-clear weather or on non-dry pavement, this should not be inferred as being safer to travel during inclement weather with wet pavement or less safe to travel in clear weather with dry pavement. These numbers likely reflect weather patterns, more days have clear weather than not. Additionally, inclement weather may impact individual behavior including whether to travel or how one travels.

Behavior Analysis of Serious Injury and Fatal Crashes

The actions and movements of individuals at the time of the crash can better illustrate what happened resulting in the collision. Understanding these actions will help direct enforcement or education efforts to reduce future crashes in Rockville.

Serious Injury and Fatal Crashes and Fault

This analysis is not to suggest blame for crashes; Vision Zero recognizes people will make mistakes but should not experience a serious injury or fatality as a result. Therefore, this data represents not only the need for people to travel more cautiously, but also the need for the transportation system to be more forgiving to all people to help lessen the severity of crashes overall. Understanding who is at fault can help direct education and enforcement efforts to the proper audiences.

There are 49 KSI crashes that did not involve pedestrians or bicycles. These KSI crashes are vehicle-to-vehicle or vehicle-to-object crashes. In 4 of these crashes, the fault was reported as unknown and it is not clear who was at fault. In most cases, the motorist suffering the injury or the other motorist would be at fault, however there are some instances where a motor vehicle may malfunction and no one is at fault.

There are 28 KSI crashes that involved a pedestrian or bicyclist, all 28 of these crashes also included a motorist. There were no reported pedestrian-pedestrian, or pedestrian-bicycle crashes. Of the reported crashes, the motorist was at fault 39% of the time, the pedestrian or bicyclist was at fault 39% of the time and it is not clear who was at fault in the remainder of crashes. In 4 of the crashes with unknown fault, the pedestrian involved died, complicating the process to determine fault.

Table 10: Party at Fault in Serious Injury and Fatal Pedestrian and Bicycle Crashes

	Serious Injury	Fatal	Combined Percentage
Motorist	9	2	39%
Pedestrian/Bicyclist	7	4	39%
Unknown	2	4	21%

Expanding the dataset to include all injury and fatal crashes involving pedestrians and bicyclists indicates more crashes in which the motorist is at fault. 67% of injury and fatal crashes involving pedestrians and bicyclists indicate the motorist as being at fault.

Table 11: Party at Fault in Injury (all severities) and Fatal Pedestrian and Bicycle Crashes

	Injury	Fatal	Combined Percentage
Both	4		2%
Motorist	145	1	67%
Pedestrian/Bicyclist	49	4	24%
Unknown	18	5	11%

Motor Vehicle Collision Types for Fatal and Severe Injury Crashes

Collision Type refers to how a vehicle impacts into another vehicle. For instance, a collision type of “Same Direction Rear End” indicates a crash where one vehicle crashes into the rear of another vehicle.

The table below includes KSI crashes that only involved motor vehicles. Of these, the most common motor vehicle collision type were rear end crashes, where both vehicles are traveling the in the same direction. The second most common were single vehicle crashes, which refer to crashes where a motorist crashes into a fix object, such as streetlight or barricade. The third most common collision type were head on left turn crashes.

Table 13: Serious Injury and Fatal Crashes by Collision Type for Motorist Crashes

	Serious Injury	Fatal	Combined Percentage
Angle Meets Left Head On	1		2%
Angle Meets Left Turn	1		2%
Head On	2		4%
Head on left turn	7	1	16%
Other	4		8%
Same Direction Rear End	11	2	27%
Same Direction Right Turn	1		2%
Same Direction Sideswipe	2		4%
Single Vehicle	9	3	24%
Straight Movement Angle	4	1	10%

Expanding this data set to include all injury and fatal motor vehicle crashes that did not include pedestrians or bicyclists indicates slightly different findings. While the most common collision type remains rear end same direction crashes, straight movement angle crashes is the second most common. Head on left turn crashes is the third most common and single vehicle crashes is the fourth most common.

Table 14: Injury (all severities) and Fatal Crashes by Collision Type for Motorist Crashes

	Injury	Fatal	Combined percentage
Angle Meets Left Head On	2		0%
Angle Meets Left Turn	13		1%
Angle Meets Right Turn	11		1%
Head On	17		2%
Head On Left Turn	147	1	14%
N/A	1		0%
Opposite Direction Both Left Turn	1		0%
Opposite Direction Sideswipe	5		0%
Other	77		7%

Same Dir Both Left Turn			0%
Same Dir Rear End	346	2	33%
Same Dir Rend Left Turn	6		1%
Same Dir Rend Right Turn	1		0%
Same Direction Left Turn	11		1%
Same Direction Right Turn	15		1%
Same Direction Sideswipe	47		4%
Single Vehicle	96	2	9%
Straight Movement Angle	244	2	23%

Pedestrian and Bicyclist Collision Types for Serious Injury and Fatal Crashes

Similar to motor vehicle movements, pedestrian and bicyclist movements are also reported as part of crashes that involve pedestrians and bicyclists. There are 28 KSI crashes involving pedestrians and bicyclists and motorists. The most common movement for pedestrians was crossing the street at an intersection. Four of the KSI crashes reported unknown pedestrian or bicyclist movements, this refers to crashes in parking lots and one crash where the pedestrian was inside a building. The crashes reported as unknown are unclear regarding the pedestrian movement. Table 15: Serious Injury and Fatal Crashes by Pedestrian and Bicyclist Movement

	Serious Injury	Fatal	Combine Percentage
Cross/Enter at Intersection	7	3	36%
Cross/Enter not at Intersection	2	2	14%
Standing	2		7%
Walking/Cycling on Sidewalk	1		4%
Walking/Riding w/Traffic	1		4%
Getting off/on Vehicle	1		4%
Other	2	2	14%
Unknown	2	3	18%

Visibility and Serious Injury and Fatal Crashes Police include “Visibility” as part of the crash report for pedestrian and bicyclist crashes. Visibility refers to a pedestrian’s clothing – dark, light, or mixed – and the reflectors or lights on a bicycle. It is important to note that it is not illegal to wear dark colors and RCPD does not attribute fault to a pedestrian solely based upon the color of their clothing. Mixed clothing was the most common reported visibility for KSI pedestrian and bicycle crashes.

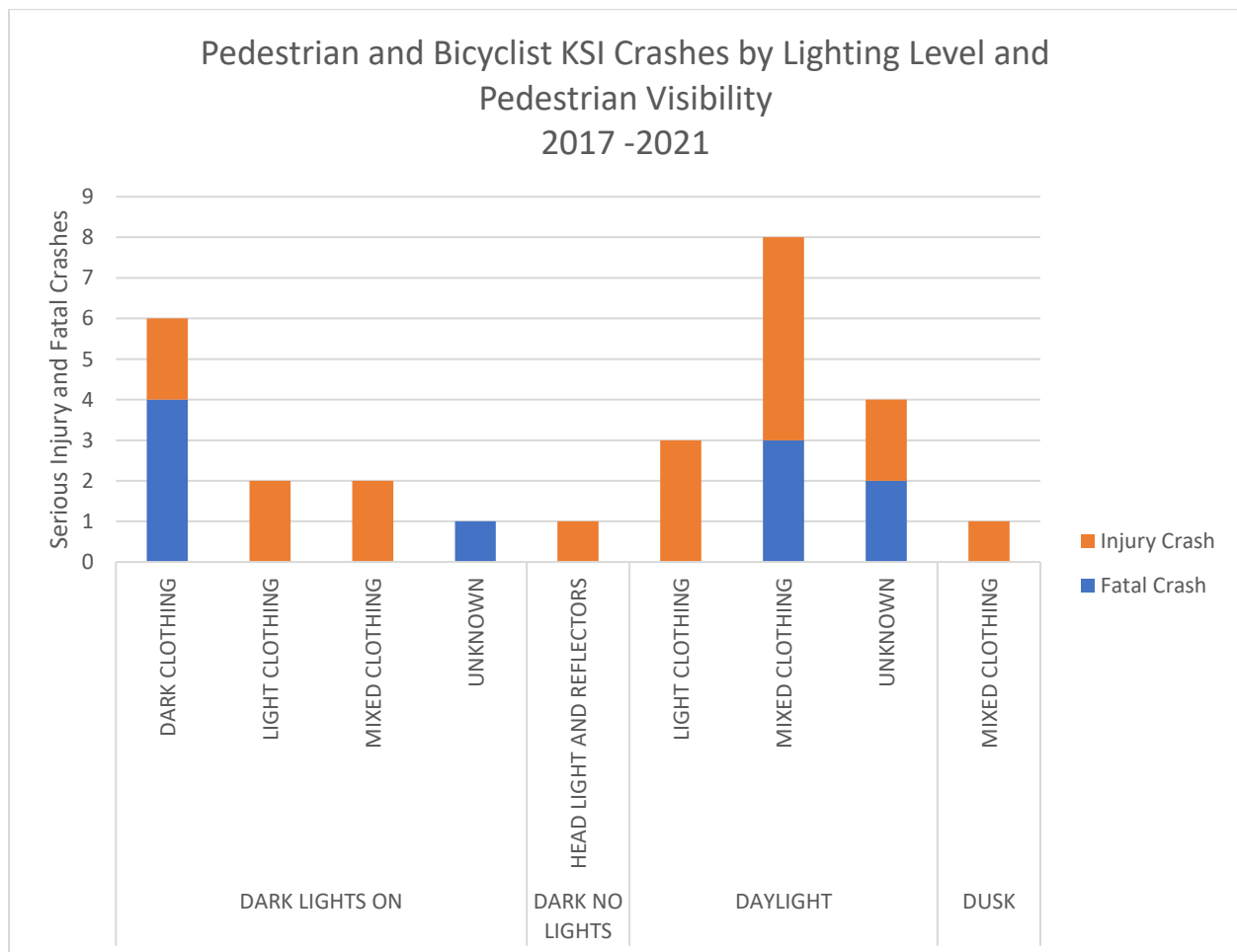
Table 16: Pedestrian and Bicyclist Visibility for Serious Injury and Fatal Crashes

	Serious Injury	Fatal	Combine Percentage
Dark Clothing	2	4	21%
Head Light and Reflectors Present	1		4%

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Light Clothing	5		18%
Mixed Clothing	8	3	39%
Unknown	3	2	18%

This information can be augmented by also analyzing the lighting conditions at the time of the crash. 15 pedestrian and bicyclist KSI crashes occurring during the day and 13 crashes occurred in darkness. Of the crashes that occurred in darkness, the pedestrian was wearing dark clothing 21% of the time. 14% of crashes occurring in the dark, pedestrians were wearing light or mixed color clothing. The most fatal crashes were during darkness and the pedestrian was wearing dark clothing.



There is no analogous variable reported for motorist crashes. The reports do not indicate vehicle paint color, whether the paint is reflective or matte, or whether the lights on a motor vehicle were functioning and turned on. Between 2017 and 2021, there were 222 single vehicle crashes during darkness wherein a motorist crashed into a fixed object. Fixed objects include buildings, concrete barriers, mailboxes, trees, etc. While some fixed objects have reflective materials or lights, such as street signs or lights, other fixed objects such as trees, do not have reflective markings or light colors.

Substance Abuse and Severe Injury and Fatal Crashes

10% of KSI crashes were reported as having “Alcohol Present” or “Alcohol Contributed.” 58% of KSI crashes reported having no substance abuse detected. The remaining 31% of crashes were reported as “Unknown” or was reported as not being applicable.

Including injury (all severities) crashes further indicates that a minority of crashes involve substance abuse. Substance abuse was not detected in 80% of crashes, while or alcohol or another illegal drug were detected in 5% of crashes. 16% of the injury (all severities) and fatal crashes were reported as “Unknown,” “Other,” or “Not Applicable.”

Table 12: Injury (all severities) and Fatal Crashes by Substance Abuse

	Injury (all severities)	Fatal	Combined Percentage
Alcohol	48	2	4%
Illegal Drug	8	0	1%
Combination	1	0	0%
Medication	3	0	0%
None Detected	996	11	80%
N/A	146	2	12%
Unknown	45	2	4%
Other	2	0	0%

Vision Zero – Community Perceptions

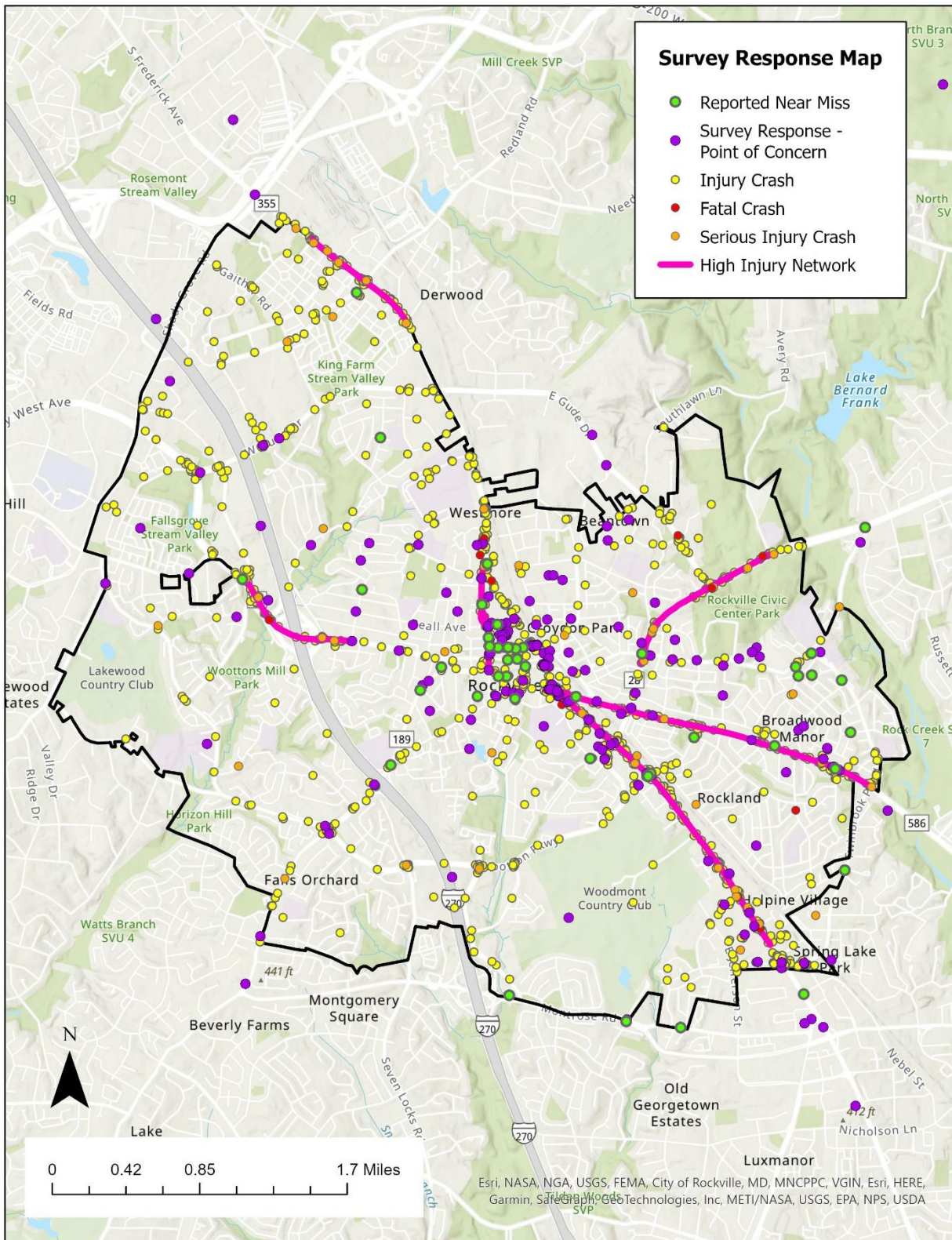
The City's Vision Zero Website includes two surveys to solicit comments and recommendations from the public. The Vision Zero Survey is a general survey about perceptions of traffic safety. The Vision Zero Near-Miss Questionnaire provides an opportunity for residents to report near-miss traffic collisions that they may have experienced in the City. A near-miss traffic collision is an incident where a person traveling by any mode nearly avoids a collision. Near misses often impact perceptions of traffic safety. For both the survey and the questionnaire, it is important to note that respondents are self-selecting, and that data collected from these tools needs to be considered in context of all residents and visitors who may or may not participate.

Points of Concern and Near Misses

The Vision Zero survey asked residents to identify a location in Rockville where they feel the least safe based on their chosen mode of transportation. There have been 265 respondents to the Vision Zero Survey and these are shown on the below map, labeled as points of concern. Additionally, the Vision Zero Near Miss questionnaire requests respondents to identify where a near miss incident occurred. There has been 51 reported near miss incidents and these are labeled as reported near misses on the map below. The below map also includes the High Injury Network, and the locations of reported injury crashes, serious injury crashes, and fatal crashes for all travel modes.

The points of concern are spread throughout the City, along the HIN roadway segments and centered in the Town Center area. Some additional corridors emerge, such as along Baltimore Avenue and along Rollins Avenue. The reported near misses are located mostly within Town Center, however there are also other discrete points along state roadways, and near Baltimore Road and Twinbrook Parkway. Most of the points of concern and near misses are consistent with the locations of reported injury and fatal crashes. While not true for all locations, many of the location where community members and survey respondents perceived feeling unsafe in terms of transportation or experienced a near miss are also locations where crashes have occurred.

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Community Equity and Crash Locations

The United States Department of Transportation has identified census tracts as Disadvantaged Communities to more equitably allocate transportation funding for projects in communities that have been historically underserved part of the Justice 40 initiative. There are two census tracts in Rockville identified as having an overall disadvantage disadvantaged.

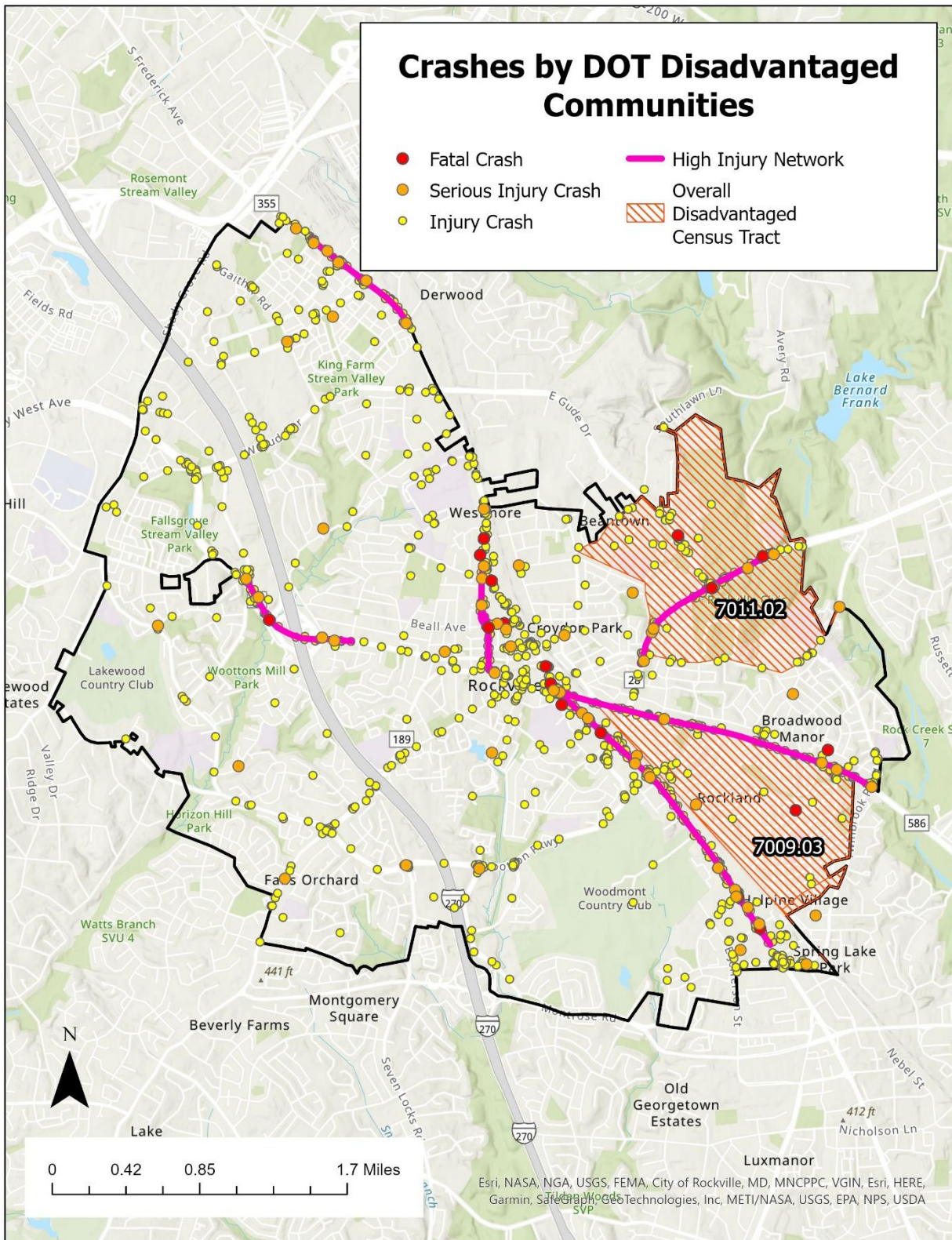
Table 14: Injury (all severities) and Fatal Crashes in Disadvantaged Census Tracts

Census Tract #	Fatal			Injury (all severities)		
	Total	Per Capita	Per Sq. Mile	Total	Per Capita	Per Sq. Mile
7011.02	1	0.0001	1.25	81	0.0090	72.68
7009.03	3	0.0013	2.03	58	0.0342	54.69
Rockville	17	0.0003	1.24	1,249	0.0186	91.57

Census Tract 7011.02 includes neighborhoods on either side of Baltimore Road and E. Gud Drive. This tract has a higher fatal crash rate per capita and per square mile than the City as a whole, but a lower injury crash rate per capita and per square mile.

Census Tract 7009.03 includes the neighborhood in between Viers Mill Road (Md 586) and the WMATA rail tracks parallel to Rockville Pike. This tract has a high rate of fatal crashes per capita and per mile than the city as a whole. It has higher injury crash rate per capita, but a lower crash rate per square mile compared to all of Rockville. This suggests the City can focus safety efforts in this census tract, including education and enforcement campaigns and roadway safety projects.

The below map shows the location of the census tracts designated a having an overall disadvantage according to the Department of Transportation, the High Injury Network, and the locations of fatal, serious injury, and all other injury crashes.



Conclusion and Recommended Next Steps

A Vision Zero approach recognizes that people in all modes make mistakes and crashes will occur as a result. This level of analysis examines factors and behaviors that influence the possibility of KSI crashes over time.

There were 77 crashes in Rockville from 2017-2021 that resulted in a person being killed or seriously injured.

The most common location for crashes were roadways with a “major” functional classification, this includes both KSI crashes and minor injury crashes. These roads also tend to have speed limits of 35 MPH or higher, and four or more travel lanes. DPW staff, at the direction of the Mayor and Council, continues to collaborate with MDOT SHA through regularly coordination meetings and ongoing correspondence to raise concerns, share possible improvements, and jointly seek opportunities for federally funded grants. Staff should continue these efforts and to share the findings of this report with MDOT SHA staff, especially the updated HIN and crash statistics along state-maintained roadways.

Copied below are the HIN roadways and map.

Table X: High Injury Network

Roadway Name	# of KSI Crashes	Roadway Ownership
Rockville Pike (MD 355)	14	MDOT SHA
W Montgomery Avenue (MD 28)	6	MDOT SHA
Norbeck Road (MD 28)	6	MDOT SHA
Frederick Road (MD 355)	6	MDOT SHA
Veirs Mill Road (MD 386)	5	MDOT SHA
North Washington Street	4	City of Rockville

North Washington Street is the only street in the HIN that is owned and maintained by the City of Rockville. A Complete Streets/Road Diet construction project for this street between Hungerford Drive (MD 355) and West Jefferson Street (MD 28), is scheduled to begin in early 2023. This project includes separated bicycle lanes, narrowed lane widths, and other improvements that are expected to reduce motorist speeding and provide for other roadway users. When this roadway project is completed, staff will study the traffic volumes and speeds along this street and track crashes to compare with previous years.

The second objective for the Action Item #1 is to, “Identify projects to improve safety at areas in the HIN.” Staff will continue to work with MDOT SHA and advocate for safe transportation facilities along state-maintained roadways. Additionally, DPW staff will continue to advance improvements and city-maintained intersections and roadways.

The results of this analysis, as well as subsequent analyses, should also be used to guide other Vision Zero Action items. These include:

- Action Item #4, Evaluate Crossings and Unsignalized Intersections
- Action Item #7, Accelerate Sidewalk Construction
- Action Item #9, Expand Network of Safe Bicycling Facilities

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- Action Item # 12, Expand Traffic Law Enforcement and Distracted Driving Detection Program
- Action Item #16, Create Comprehensive Outreach Strategy
- Action Item #20, Training in the Community
- Action Item #21, Change Policies, Regulations, and Laws
- Action Item #27, Improve Crash Data Collection

City staff will continue to implement intersection safety audits and implement recommended improvements at City-maintained intersections throughout Rockville. City staff will also collaborate with MDOT SHA to undertake similar safety audits and implement improvements at State-maintained intersections in the City. The next intersections for review include:

#	Street	Cross-Street	Injury + Fatal Crashes (2017 – 2021)
1	Rockville Pike (MD 355)	Edmonston Dr	18
2	Hungerford Dr (MD 355)	N Washington St	18
3	Hungerford Dr (MD 355)	Mannakee St	17
4	Frederick Rd (MD 355)	Watkins Pond Blvd	17
5	Veirs Mill Rd (Md 586)	Broadwood Dr	16
6	Rockville Pike (MD 355)	First St/Wootton Pkwy	15
7	Rockville Pike (MD 355)	Templeton Pl	15
8	Norbeck Rd (MD 28)	Avery Rd	13
9	First St (MD 28)	Baltimore Rd	13
10	Rockville Pike (MD 355)	Congressional Ln	13
11	Rockville Pike (MD 355)	Veirs Mill Rd (MD 28)	13
12	Rockville Pike (MD 355)	Talbott St	12
13	Frederick Rd (MD 355)	Ridgemont Ave	12
14	Hungerford Dr (MD 355)	Beall Ave	12
15	Rockville Pike (MD 355)	Richard Montgomery St	12
16	W Montgomery Ave (MD 28)	Hurley Ave	11
17	Hungerford Dr (MD 355)	Frederick Avenue	9
18	Veirs Mill Rd (MD 586)	Woodburn Rd	7
19	Rockville Pike (MD 355)	Mt Vernon Pl	7
20	Halpine Rd	Shopping Center Entrance	7
21	Wootton Pkwy	W Edmonston Dr (north)	6
22	E Jefferson St	Congressional Ln	6
23	Gaither Rd	Piccard Dr	4
24	King Farm Blvd	Grand Champion Dr	4
25	Baltimore Rd	S Stonestreet Ave	4
26	Woodland Dr	Park Rd	4

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27	Redland Blvd	Pleasant Dr	3
28	Redland Blvd	Thompson Dairy Way	3
29	First St (MD 28)	Grandin Ave	2
30	Wootton Pkwy	Pasture Brook Way	1

The City will also inventory and evaluate the feasibility of adding marked crosswalks near bus stops or relocating bus stops to location closer to marked crosswalks. This analysis will begin with the 142 bus stops that are not within 150 feet of a marked crosswalk.